SPECIFICATION AMENDMENT

OK to enter J.L

A substitute specification, which is voluntarily corrected the typographic errors and informalities contained in the original PCT application is hereby submitted. A "version with markings to show changes made" is also separately attached. A Declaration of Applicant(s) is accompanied with the substitute specification to swear NO NEW MATTER entered.

TIME-INTERLEAVED BAND-PASS DELTA-SIGMA MODULATOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a time-interleaved bandpass Δ-Σ modulator (hereinafter, referred to as "a delta-sigma modulator"). More particularly, this invention relates to a delta-sigma modulator including a plurality of channel blocks, of which the phase of the lock frequencies is different from each other, so as to reduce a clock frequency.

2. Related Prior Art

A delta-sigma modulator generally includes a lowpass modulator and a bandpass modulator. The lowpass modulator is used for audio devices, while the bandpass modulator is used for radio communication. The delta-sigma modulator may be composed of a continuous-time circuit or a discrete-time circuit, with reference to Fig. 1a and Fig. 1b. A bandpass delta-sigma modulator in Fig. 1b samples the intermediate-frequency (IF) as many as four times, and removes quantization noise (this is referred to as shaping). In the modulator, because the noise is shaped at the input signal within the desired band, a high signal-to-noise ratio (SNR) can be achieved at the input signal on the desired band.

A bandpass delta-sigma modulator that is implemented by a continuous-time circuit (see Fig. 1a) has an advantage that it can operate in a high frequency band.